

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A catalyst combustion system comprising:
a closable first fuel supply line which supplies a fluid containing a first fuel;
a closable first oxidizer supply line which supplies a fluid containing a first oxidizer for the first fuel to be combustible therewith under assistance of a catalyst;
a second fuel supply line which supplies a fluid containing a second fuel different from the first fuel;
a second oxidizer supply line which supplies a fluid containing a second oxidizer for the second fuel to be combustible therewith under assistance of the catalyst; and
a catalyst combustor configured to alternately perform a first catalyst combustion between the first fuel and the first oxidizer and a second catalyst combustion between the second fuel and the second oxidizer, and to supply as a thermal medium a fluid containing one of a combustion product of the first catalyst combustion and a combustion product of the second catalyst combustion to the system, wherein
the catalyst combustor
comprises a first catalyst combustion portion connected to the first fuel supply line and the first oxidizer supply line,
a second catalyst combustion portion connected to the second fuel supply line and the second oxidizer supply line, and
a fluid communication portion ~~connecting between~~ between the first catalyst combustion portion and the second catalyst combustion portion, which connects the first catalyst combustion portion and the second catalyst combustion portion in fluid communication with
~~to~~ each other,
wherein the first catalyst combustion portion and the second catalyst combustion portion have predetermined fluid resistances, wherein
the first catalyst combustion takes place only in the first catalyst combustion portion,
as the fluid containing the first fuel and the fluid containing the first oxidizer are supplied to the first catalyst combustion portion, and

the second catalyst combustion takes place in both the first and second catalyst combustion portions, as the fluid containing the second fuel and the fluid containing the second oxidizer are supplied to the second catalyst combustion portion.

~~And has a fixed relationship provided among a fluid resistance of the first catalyst combustion portion, a fluid resistance of the second catalyst of the second catalyst combustion portion, and a fluid resistance of the fluid communication portion, whereby substantially the first catalyst combustion is caused to occur simply in the first catalyst combustion portion, and the second catalyst combustion is caused to occur in the first catalyst combustion portion and the second catalyst combustion portion.~~

2. (Currently Amended) A catalyst combustion system according to claim 1, wherein ~~the fixed relationship includes that the fluid resistance of the second catalyst combustion portion is greater than the fluid resistance of the first catalyst combustion portion.~~

3. (Currently Amended) A catalyst combustion system comprising:
a closable first fuel supply line which supplies a fluid containing a first fuel;
a closable first oxidizer supply line which supplies a fluid containing a first oxidizer for the first fuel to be combustible therewith under assistance of a catalyst;
a second fuel supply line which supplies a fluid containing a second fuel different from the first fuel;
a second oxidizer supply line which supplies a fluid containing a second oxidizer for the second fuel to be combustible therewith under assistance of the catalyst; and
a catalyst combustor configured to alternately perform a first catalyst combustion between the first fuel and the first oxidizer and a second catalyst combustion between the second fuel and the second oxidizer, and to supply as a thermal medium a fluid containing one of a combustion product of the first catalyst combustion and a combustion product of the second catalyst combustion to the system, wherein
the catalyst combustor
comprises a first catalyst combustion portion connected to the first fuel supply line and the first oxidizer supply line,

a second catalyst combustion portion connected to the second fuel supply line and the second oxidizer supply line, and

a fluid communication portion between the first catalyst combustion portion and the second catalyst combustion portion, which connects the first catalyst combustion portion and the second catalyst combustion portion in fluid communication with each other,

wherein the first catalyst combustion portion and the second catalyst combustion portion have predetermined fluid resistances, wherein

the first catalyst combustion takes place only in the first catalyst combustion portion, as the fluid containing the first fuel and the fluid containing the first oxidizer are supplied to the first catalyst combustion portion, and

the second catalyst combustion takes place in both the first and second catalyst combustion portions, as the fluid containing the second fuel and the fluid containing the second oxidizer are supplied to the second catalyst combustion portion ~~A catalyst combustion system according to claim 2,~~

~~wherein the fixed relationship includes that the fluid resistance of the second catalyst combustion portion is substantially equal to a sum of the fluid resistance of the first catalyst combustion portion and the~~ a fluid resistance of the fluid communication portion.

4. (Currently Amended) A catalyst combustion system comprising:
a closable first fuel supply line which supplies a fluid containing a first fuel;
a closable first oxidizer supply line which supplies a fluid containing a first oxidizer for the first fuel to be combustible therewith under assistance of a catalyst;
a second fuel supply line which supplies a fluid containing a second fuel different from the first fuel;
a second oxidizer supply line which supplies a fluid containing a second oxidizer for the second fuel to be combustible therewith under assistance of the catalyst; and
a catalyst combustor configured to alternately perform a first catalyst combustion between the first fuel and the first oxidizer and a second catalyst combustion between the second fuel and the second oxidizer, and to supply as a thermal medium a fluid containing one of a combustion product of the first catalyst combustion and a combustion product of the second catalyst combustion to the system, wherein

the catalyst combustor
comprises a first catalyst combustion portion connected to the first fuel supply line
and the first oxidizer supply line,
a second catalyst combustion portion connected to the second fuel supply line and the
second oxidizer supply line, and
a fluid communication portion between the first catalyst combustion portion and the
second catalyst combustion portion, which connects the first catalyst combustion portion and
the second catalyst combustion portion in fluid communication with each other,
wherein the first catalyst combustion portion and the second catalyst combustion
portion have predetermined fluid resistances, wherein
the first catalyst combustion takes place only in the first catalyst combustion portions,
as the fluid containing the first fuel and the fluid containing the first oxidizer are supplied to
the first catalyst combustion portion, and
the second catalyst combustion takes place in both the first and second catalyst
combustion portions, as the fluid containing the second fuel and the fluid containing the
second oxidizer are supplied to the second catalyst combustion portion ~~A catalyst combustion~~
~~system according to claim 1,~~
wherein the first catalyst combustion portion comprises
a first gas chamber connected to the first fuel supply line and the first oxidizer supply
line,
a first set of catalyst combustion path parts connected to the first gas chamber,
a first substrate formed with the first set of catalyst combustion path parts,
and
a heat insulating first accommodation part which accommodates the first substrate,
the fluid resistance of the first catalyst combustion portion is representative of a sum
of a fluid resistance of the first gas chamber and a fluid resistance of the first set of catalyst
combustion path parts,
the second catalyst combustion portion comprises
a second gas chamber connected to the second fuel supply line and the second
oxidizer supply line,
a second set of catalyst combustion path parts connected to the second gas chamber,

a second substrate formed with the second set of catalyst combustion path parts, and
a heat insulating second accommodation part which accommodates the second
substrate, and

the fluid resistance of the second catalyst combustion portion is representative of a
sum of a fluid resistance of the second gas chamber and a fluid resistance of the second set of
catalyst combustion path parts.

5 (Original) A catalyst combustion system according to claim 4, wherein
the first set of catalyst combustion path parts comprises
a first set of combustion paths communicating with the first gas chamber, and
a first set of films of the catalyst configured to define the first set of combustion paths,
the fluid resistance of the first set of catalyst combustion path parts is representative of
a fluid resistance of the first set of combustion paths,
the second set of catalyst combustion path parts comprises
a second set of combustion paths communicating with the second gas chamber, and
a second set of films of the catalyst configured to define the second set of combustion
paths, and
the fluid resistance of the second set of catalyst combustion path parts is
representative of a fluid resistance of the second set of combustion paths.

6. (Original) A catalyst combustion system according to claim 5, wherein
the first set of combustion paths comprises a first plurality of straight fluid paths
provided through the first substrate,
the second set of combustion paths comprises a second plurality of straight fluid paths
provided through the second substrate, the second plurality being greater than the first
plurality, and
the first plurality of straight fluid paths has a greater average sectional area than
the second plurality of straight fluid paths.

7. (Original) A catalyst combustion system according to claim 5, wherein the first set of combustion paths includes a combustion path having a greater sectional area at an upstream end thereof than at a downstream end thereof.

8. (Original) A catalyst combustion system according to claim 4, wherein the fluid communication portion comprises a separation wall configured to separate the first gas chamber from the second gas chamber, and a set of through holes formed in the separation wall, and the fluid resistance of the fluid communication portion is representative of a fluid resistance of the set of through holes.

9. (Original) A catalyst combustion system according to claim 1, wherein the first catalyst combustion portion has a smaller heat capacity than the second catalyst combustion portion.

10. (Currently Amended) A catalyst combustion system comprising:
a closable first fuel supply line which supplies a fluid containing a first fuel;
a closable first oxidizer supply line which supplies a fluid containing a first
oxidizer for the first fuel to be combustible therewith under assistance of a catalyst;
a second fuel supply line which supplies a fluid containing a second fuel different
from the first fuel;
a second oxidizer supply line which supplies a fluid containing a second oxidizer for
the second fuel to be combustible therewith under assistance of the catalyst; and
a catalyst combustor configured to alternately perform a first catalyst combustion
between the first fuel and the first oxidizer and a second catalyst combustion between the
second fuel and the second oxidizer, and to supply as a thermal medium a fluid containing
one of a combustion product of the first catalyst combustion and a combustion product of the
second catalyst combustion to the system, wherein
the catalyst combustor

comprises a first catalyst combustion portion connected to the first fuel supply line and the first oxidizer supply line,

a second catalyst combustion portion connected to the second fuel supply line and the second oxidizer supply line, and

a fluid communication portion between the first catalyst combustion portion and the second catalyst combustion portion, which connects the first catalyst combustion portion and the second catalyst combustion portion in fluid communication with to each other,

wherein the first catalyst combustion portion and the second catalyst combustion portion have predetermined fluid resistances, wherein

the first catalyst combustion takes place only in the first catalyst combustion portion, as the fluid containing the first fuel and the fluid containing the first oxidizer are supplied to the first catalyst combustion portion, and

the second catalyst combustion takes place in both the first and second catalyst combustion portions, as the fluid containing the second fuel and the fluid containing the second oxidizer are supplied to the second catalyst combustion portion

wherein the first catalyst combustion portion has a smaller heat capacity than the second catalyst combustion portion and ~~A catalyst combustion system according to claim 9,~~ wherein the catalyst combustor has a heat insulating layer interposed between the first catalyst combustion portion and the second catalyst combustion portion.

11. (Original) A catalyst combustion system according to claim 1, wherein the first catalyst combustion portion is enclosed by the second catalyst combustion portion.

12. (Original) A catalyst combustion system according to claim 1, wherein the catalyst combustor has a substantially cylindrical enclosure circumscribed about the first catalyst combustion portion and the second catalyst combustion portion.

13. (Currently Amended) A fuel reforming system including a fuel reformer configured to reform a fuel using the heat thermal medium of a catalyst combustion system according to claim 1.

14. (Withdrawn) A fuel reforming system according to claim 13, wherein the second fuel contains the fuel reformed by the fuel reformer.

15. (Withdrawn) A fuel cell system including a fuel cell having a fuel electrode configured to consume the reformed fuel of a fuel reforming system according to claim 13.

16. (Withdrawn) A fuel cell system according to claim 15, wherein the second fuel contains an effluent gas of the fuel electrode of the fuel cell, and the second oxidizer contains an effluent gas of an air electrode of the fuel cell.

17. (New) A catalyst combustion system according to claim 1, further comprising a separation wall disposed between the first catalyst combustion portion and the second catalyst combustion portion.

18. (New) A catalyst combustion system according to claim 17, wherein the fluid communication portion comprises an opening through the separation wall.

19. (New) A catalyst combustion system according to claim 18, wherein the fluid communication portion comprises an array of openings through the separation wall.

20. (New) A catalyst combustion system according to claim 19, wherein at least one hole is circular, elliptic, triangular, rectangular or polygonal.